

ophthalmological point of view (already for a long time). For one-eyed athletes or sports persons with monocular defective vision protective sports goggles should be obligatory in order to protect the remaining healthy eye.

### 347 HOW CAN WE PROTECT ATHLETES FROM DENTAL EROSION?

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**Background** Our data on more than 800 participants shows that dental erosion (DE) affects up to 45% of elite athletes and may have physical and psychosocial impacts. The condition is associated with consumption of sports drinks and is exacerbated by reduced salivary flow. The protein rich layer called dental pellicle (DP) may have a protective function for DE and this might prove to be a useful therapeutic target in elite sport.

**Objectives** To assess the protective function of DP against DE.

**Design** In vitro study.

**Setting** Laboratory.

**Participants** 40 bovine incisors

**Interventions** Two levels. 1: We exposed twenty bovine incisors to an energy drink (pH 3.1) at 24, 48 and 72 hours to create an in vitro erosion model. 2: We used fresh human saliva to form dental pellicle on the buccal surface of twenty incisors to create an in-vitro pellicle model. Erosive lesions were investigated both in the presence and absence of a layer of dental pellicle.

**Main outcome measurement** Mean depth of erosive lesions by optical coherence tomography (OCT) and X-ray Microtomography (XMT).

**Results** OCT showed the mean thickness of amorphous enamel before immersion in the erosive medium was 64 µm (SD 2.3, IQR 54.7 – 63.2). The mean depth of the erosive lesion after immersion was 240.8 µm (SD 32.7, IQR 244.6 – 263.8) ( $p < 0.001$ ) at 72 hours. In contrast, mean depth of lesion in the presence of the dental pellicle was 84.3 (SD 18.9, IQR 93.2 – 75.3) ( $p < 0.03$ ). XMT showed the mean depth of erosive lesions was 130 µm (SD 28.2), whereas in the presence of DP was 82.4 µm (SD 15.6) ( $p < 0.001$ ).

**Conclusions** Erosion was reduced but not prevented by presence of dental pellicle. This model shows promise as a method to investigate novel interventions to prevent DE in elite athletes.

### 348 MICROBIOME ANALYSIS IN ELITE SPORT

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**Background** There is increasing interest in the microbiome in performance and prevention of illness.

**Objective** To investigate characteristics of oral and gut microbiomes in elite sport.

**Design** Metagenomic sequencing performed on stool and saliva samples at baseline and three months. Taxonomic identification of the DNA sequence data generated on the Illumina sequencing platform, followed by unsupervised Principle Component Analyses (PCA). UCL Research Ethics Committee ID Number: 6388/002.

**Setting** 1: A GB Olympic team, n=18; 2: English premiership rugby team, n=18; 3: Healthy volunteers (non-athletes) n=28.

**Participants** Aged  $\geq 18$  years, able to understand consent process, for health controls body mass index 18 to 30 kg/m<sup>2</sup>.

**Assessment Of Risk Factors** Oral health, BMI, use of antibiotics.

**Outcome Measurements** Unsupervised PCA.

**Results** Two distinct clusters emerged, one of athletes and one of non-athletes. Specific species-level signatures distinguishing the two clusters as well as each cohort were identified, including *Fusicatenibacter sacchrorivans* enriched in athlete samples relative to non-athlete controls, *Slackia iso flavoniconvertans* enriched in rugby relative to both Olympic athletes and non-athletes, and *Klebsiella pneumoniae* enriched in Olympic cohort relative to both rugby and non-athletes (all  $P < 0.005$ ). For saliva PCA analyses, no distinct clusters emerged between the two athlete cohorts or timepoints. However, specific species-level signatures distinguishing the groups were identified, including multiple *Neisseria spp.* being elevated in rugby relative to Olympic athletes at both timepoints, *Prevotella histicola* being elevated in Olympic athletes relative to rugby at both timepoints, and *Bifidobacterium longum* being almost exclusively detected in the Olympic cohort but not rugby.

**Conclusions** Marked differences in microbiome signatures were found both between elite athletes and non-athletes and between team and individual sport cohorts. Further studies may help identify microbial factors related to optimal food conversion, performance or recovery, and prediction of illness risk.

### 349 EQUIPMENT-RELATED RISK FACTORS FOR ACL INJURY AMONG RECREATIONAL SKIERS – A CASE CONTROL STUDY

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**Background** In recreational skiing, an ACL injury is one of the most common diagnosis.

**Objective** To compare equipment-related risk factors between ACL injured and uninjured skiers.

**Design** Case-Control study over the 3 winter seasons 2016/17–2018/19 in one major Austrian ski resort.

**Participants** 248 ACL injured (52% females) and 1054 uninjured skiers (48% females).

**Assessment of Risk Factors** ACL injury was diagnosed by MRI in a sports clinic located in the ski area. Ski length [m] and side cut radius [m] were taken from the information given on the ski and ski length was relativized to body height [%]. Combined height of ski and binding plate [mm] at the front ( $H_F$ ) and back part ( $H_B$ ) of the ski binding, and height at the toe ( $H_T$ ) and heel piece ( $H_H$ ) of the ski boot [mm] were measured with a digital sliding caliper. Quotients between  $H_F$  and  $H_B$  as well as between  $H_T$  and  $H_H$  were calculated.